2009, Mathematics - Grade 8

Question 14: Open-Response

Reporting Category: Patterns, Relations, and Algebra

Standard: 8.P.7

This item allows use of a calculator

Ms. Gleason is opening a new restaurant.

\* She has enough booths to seat up to 40 people.

\* She is ordering tables to fill the rest of the seating space.

\* Each table can seat up to 6 people.

1. If t represents the number of tables Ms. Gleason orders, write an expression to show the total number of people that can be seated at booths and tables.

2. Write an inequality that could be used to determine t, the number of tables Ms. Gleason needs to order so that she has enough seating at booths and tables for at least 125 people.

3. Solve the inequality from part (b) to determine the number of tables Ms. Gleason needs to order. Show or explain how you got your answer.

2008, Mathematics - Grade 8

Question 9: Open-Response

Reporting Category: Patterns, Relations, and Algebra

Standard: 8.P.6

This item does not allow use of a calculator

Lisa bought a silver chain. She wants to buy glass beads to put on the chain. The equation below can be used to determine y, Lisa's total cost, in dollars, to buy a silver chain and x glass beads.

y = 2x + 10

1. In your Student Answer Booklet, copy the table below and complete it using the equation. Show or explain how you got each of your answers.

**Total Cost of Silver Chain and Beads**

|  |  |
| --- | --- |
| Number of Beads  (x) | Total Cost  (y) |
| 0 | $10 |
| 5 | $20 |
| 10 |  |
| 15 |  |
| … |  |
| 25 |  |
| … |  |
| 40 |  |

2. What does the 2 in the equation represent? Explain your reasoning.

3. What does the 10 in the equation represent? Explain your reasoning.

2007, Mathematics - Grade 8

Question 9: Open-Response

Reporting Category: Patterns, Relations, and Algebra

Standard: 8.P.6

This item does not allow use of a calculator

Marisa drank one cup of milk and ate x small vanilla cookies for a snack. The linear equation below represents y, the total number of calories in Marisa’s snack.

y = 12x + 120

a. What is the y-intercept of the line represented by this equation?

b. Explain what the y-intercept tells us about Marisa’s snack.

c. What is the slope of the line represented by this equation?

d. Explain what the slope tells us about Marisa’s snack.

e. If Marisa eats 9 small vanilla cookies, what is the total number of calories in her snack? Show or explain how you got your answer.

2006, Mathematics - Grade 8

Question 28: Open-Response

Reporting Category: Patterns, Relations, and Algebra

Standard: 8.P.10

This item allows use of a calculator

Currently, Irina exercises a total of 135 minutes during each week. She is planning to begin the following new exercise program.

\* The exercise program will last 6 weeks.

\* During each week of the program, she will exercise 15 minutes more than she exercised the previous week.

1. Copy the table below into your Student Answer Booklet. In the table, week 0 shows the number of minutes per week Irina exercised before she started the new program. Complete your table to show the number of minutes that Irina will exercise during each of the 6 weeks if she follows her new exercise program.

Minutes of Exercise During Each Week

|  |  |
| --- | --- |
| Week (w) | Number ofMinutes (n) |
| 0 | 135 |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |

2. For the data shown in the table, write an equation that shows the relationship between w and n.

3. Based on the equation you wrote in part (b), what is the total number of minutes Irina will exercise in week 20 if she continues her exercise program beyond 6 weeks? Show or explain how you got your answer.

2005, Mathematics - Grade 8

Question 9: Open-Response

Reporting Category: Patterns, Relations, and Algebra

Standard: 8.P.1

Standard: 8.D.2

This item does not allow use of a calculator

Jian made some designs using equilateral triangles, as shown below. He noticed that as he added new triangles, there was a relationship between n, the number of triangles, and p, the outer perimeter of the design.



The table below lists the outer perimeters for the designs shown.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Number of Triangles |  | 1 | 2 | 3 | 4 | ... | n |
| Outer Perimeter(in units) | 3 | 4 | 5 | 6 | ... | p |  |

1.If the pattern is continued, what would be the outer perimeter of a design using 10 triangles?

2.Write a rule for finding p, the outer perimeter for a design that uses n triangles.

3. On the grid in your Student Answer Booklet, draw a scatterplot on a coordinate plane that shows the relationship between the number of triangles and the outer perimeter of the design. Be sure to label the axes.

2003, Mathematics - Grade 8

Question 28: Open-Response

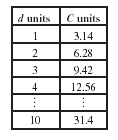
Reporting Category: Patterns, Relations, and Algebra

Standard: 8.P.1

Standard: 8.M.3

This item allows use of a calculator

The table below shows how C, the circumference of a circle, depends on d, its diameter.



An equation that shows the relationship between the diameter of a circle and its circumference is C =d, where 3.14 is used for .

1. What is the circumference of a circle with a diameter of 6 units?

2. What is the diameter of a circle with a circumference of 26.69 units?

3. On the grid in your Student Answer Booklet, draw a line graph on a coordinate plane showing the relationship between the diameter of a circle and its circumference. Be sure to label the axes.

4. Explain how you could use your graph to approximate the circumference of a circle with a diameter of 9 units.